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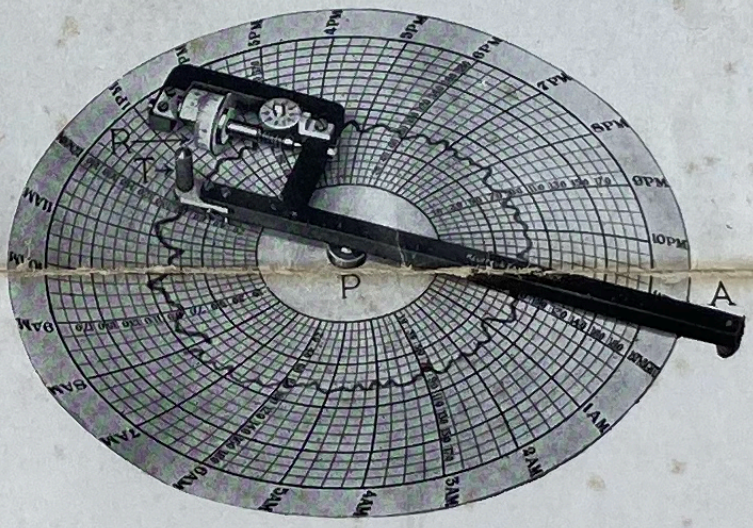
RADIAL PLANIMETER



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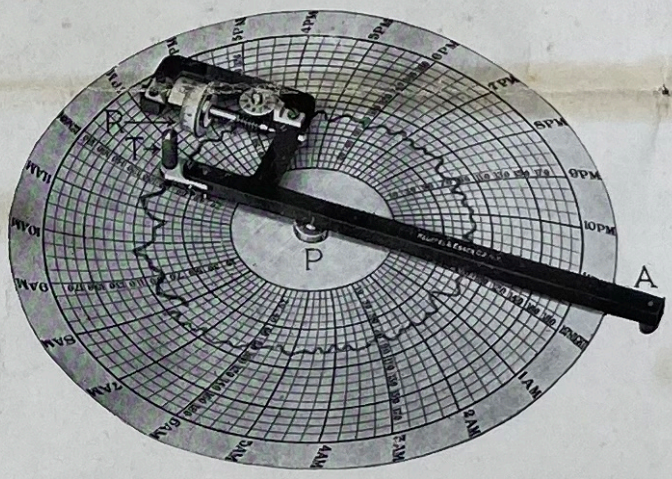

THE RADIAL PLANIMETER has been designed especially for the purpose of measuring mean heights of circular diagrams with uniformly spaced ordinates. It covers a circle one and one-half to thirteen inches in diameter, thus embracing the range of the usual disc diagrams.

DESCRIPTION

The Radial Planimeter consists of three principal parts, as shown in the cut, namely: Center pin P, tracer arm AT and measuring wheel R. In the under surface of arm AT is a groove into which fits the head of the center pin P. Measuring wheel R revolves on an axis parallel to the tracer arm, so that if the tracer point T is moved in a radial direction, the measuring wheel will not record; but if the tracer point is moved in any other direction, the measuring wheel revolves and records. The amount of the revolution depends on the distance of the tracer point from the center and the extent of the circular movement around point P.

The amount of revolution of the measuring wheel R is indicated by means of a graduated drum firmly attached to the measuring wheel R, and a vernier. The drum is graduated into 100 parts of a revolution, while $\frac{1}{1000}$ part can be read by means of the vernier. Complete revolutions up to 10 are indicated on a small, horizontal disc, which is actuated by a worm cut into the axis of the measuring wheel.

Each complete reading of the small, horizontal disc and the measuring wheel consists of a figure of four digits, the thousands being read on the horizontal disc, the hundreds and tens on the drum and the units on the vernier.

The measuring wheel is the most delicate part of the instrument, and reasonable care must be exercised to prevent injury to the pivots, the fine bearings or the knife edge of the wheel.

DIRECTIONS FOR USE

Center pin P is pressed into the drawing board over the center of the diagram. The Planimeter is then mounted with the head of the center pin in the groove of the tracer arm. By this means a compulsory working of the planimeter with reference to the center of the diagram is secured. The tracer point is now brought to the starting point of the diagram and the reading of the instrument is taken. The diagram is traced clockwise until the tracer point returns to the starting point, when a second reading is taken. The difference between these readings, multiplied by the constant 0.0004, minus the radius of the base circle, gives the mean height or mean ordinate of the diagram in inches.

Examp'e 1.—24 hour record. First reading, 1937; second reading, 9265; base circle, 1.05 inches. Mean height $= (9265 - 1937) \times 0.0004 - 1.05 = 2.9312 - 1.05 = 1.8812$ inches.

Examp'e 2.—24-hour record First reading, 3711; second reading, 18643; base circle, 1.0 inches. Mean height=(18643 3711) $\times$ 0.0004—1.0 = 5.9728—1.0 = 4.9728 inches. The counting disc has made more than one complete turn, thus altering the apparent reading (8643) to the actual reading 18643.

If the record is shorter or longer than a full revolution the result has to be reduced to a full circumference

Example 3.—24-hour record Time of record, 25.5 hours. First reading, 1234; second reading, 8734; base circle, 0.55 inches. Mean height=7500 $\times$0.0004$\times$(24 : 25.5)—0.55=2.2735 inches.

4215. Radial Planimeter, in velvet-lined case, with directions. $22 00

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PLANIMETERS

Of all mechanical devices for computation, Planimeters rank foremost as the most ingenious and useful aid to the modern Civil, Mechanical, Mining or Marine Engineer.

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